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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/977,595	10/12/2001	David W. Quint	10007154-1	2761

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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT PAPER NUMBER

2827

DATE MAILED: 08/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/977,595

Applicant(s)

QUINT ET AL.

Examiner

Ishwar (I. B.) Patel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 23-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 23-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 10 June 2002 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The corrected or substitute drawings were received on June 10, 2002. These drawings are not approved. The cross hatching pattern is not correct, the same to be selected from those shown page 600-81 of the MPEP based on the material of the parts. See also 37 CFR 1.84(h)(3) and MPEP 608.02.

Specification

2. The disclosure is objected to because of the following informalities:

(a) The sentence "The substrate 24 is preferably a ceramic **substrate such as a FR-4 or a cyanate ester**..... or plastic (laminate)" does not seem correct, page 10, line 12-14. FR-4 is a reinforced polymer and is not called a ceramic substrate.

(b) "pcb" should be - - PCB - -, page 13, line 7.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 4, 6, 8 and 25 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 4, the applicant is claiming, the spring pins provide a flexible compliance, in claim 5, the applicant is claiming, the bent region absorb the thermal variation, in claims 8 and 25, the applicant is claiming, the change in the spring pins reduce the development of electrical opens, however these are all the functional limitation and are not adding any structural limitations. The claim in dependent form should contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed.

No prior art is applied to the claims.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2,5,10,23 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Simpson (US Patent 4,764,848).

Regarding claims 1 and 23, Simpson discloses a semiconductor device assembly, comprising:

a semiconductor chip (electronic device 18, see figure 1, column 4, line 30-60);

a plurality of spring pins (pins 22, see figure 1, column 4, line 57-68);

a substrate coupled between the chip and the plurality of spring pins (substrate 16, see figure 1, column 4, line 30-65); and

a PCB coupled to the plurality of spring pins (board 10, see figure 1, column 4, line 30-55).

Regarding claim 2, Simpson further discloses the pins having a central C-shaped region (see figure 1)

Regarding claim 5 and 24, Simpson further discloses the pins include a bent central region (see figure 1).

Regarding claim 10, Simpson further discloses the substrate fabricated from ceramic, column 4, line 40-45.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3,9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson (US Patent 4,764,848) as applied to claim 1 above.

Regarding claim 3, the applicant is claiming the pins having a central V-shaped region. Though, Simpson does not explicitly disclose a V-shape region, the pins with various shapes, including V-shape is known in the art. Further the shape of the pins will depend upon various factors, such as the flexibility required, the method of manufacturing the pins, type of material used, the space available in the assembly, etc. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Simpson with spring with a central V-shaped region in order to get the desired flexibility between the substrate and the PCB.

Regarding claim 9, though Simpson does not explicitly disclose pitch of about 30 mils to 100 mils, the smaller pitch for increasing the component density is known in the art. Further, the crux of the invention of Simpson is to provide an assembly with more densely packed circuitry. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Simpson with the spring pin having a pitch of about 30 mils to 100 mils in order to increase the component density.

Regarding claim 11, the applicant is claiming a bond wire attached between said chip and said substrate. Though, Simpson does not disclose any specific method of connecting the chip and the substrate, both the bonding with or without wire are well

known in the art depending upon the uses of the assembly, such as, if distance between the pad on the chip and the substrate is to be shortest possible for the functioning of the system, the flip chip bonding without the wire will be better. In the situation where the design of the substrate is such that it is not possible to use flip chip method, using bump, a wire bonding method will be used. Further, both bonding with wire and without wire have there own advantage and disadvantage depending upon the situation. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Simpson with wire bond in order to electrically connect the chip with the substrate to have reliable connection in the particular situation.

Claim Rejections - 35 USC § 103

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson (US Patent 4,764,848) as applied to claim 1 above, and further in view of Dozier, II et al. (US Patent 5,772,451, hereafter referred to as Dozier).

In claim 7, the applicant is claiming the PCB couples to the spring pins by a force applied from the assembly. Though, Simpson does not disclose the coupling of PCB and spring pin by force applied from the assembly, the coupling with the force from the assembly is known in the art. Further, what type of coupling between PCB and pins are required will depend upon various factors, such as the ease with which the assembly can be dismantled for repair, the reliability of the connection, etc. Further, Dozier

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discloses the connection of pin by using spring clip (see Dozier figure 3, spring clip 340). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Simpson with PCB and pins connected by a force from the assembly in order to get the connection which facilitate easy dismantling during repair / replacement.

Response to Arguments

10. Applicant's arguments filed June 10, 2002, have been fully considered but they are not persuasive.

Objection to specification:

FR-4 is a reinforced polymer and is not called ceramic material. The applicant can confirm it from any chemical dictionary. Therefore correction to the specification is necessary.

112, Second Paragraph Rejection:

"the spring pins provide a flexible compliance", "the bent region absorb the thermal variation", "the change in the spring pins reduce the development of electrical opens", are functional limitation and not clearly showing any structural limitation.

Therefore, examiner is unclear whether these functions follow from the structure already recited in the claim or they require the existence of some other structural limitation. If the latter is true, examiner is unclear as to what those limitations are. In either case, clarification is required.

Claim Rejections:

Regarding claim 1 and 23, page 2 of the response, the applicant argues that the pins of the prior art extend through the substrate where as the applicant's discloser is not showing the pin extending through the substrate. This argument is moot, because the claims do not require that the pin not extend into the substrate, and the claims only specify that the pin is coupled with substrate. Coupled means linked or engaged to permit mutual influence. Furthermore, the applicant states "a substrate coupled between the chip and the plurality of springs pins; and a PCB coupled to the plurality of spring pins," and figure 1 of the applied prior art, clearly shows the substrate coupled between the chip and the plurality of the spring pins and a PCB coupled to the plurality of spring pins.

Regarding the applicant's argument on page 2 of the response, " a substrate coupled between the chip and the plurality of springs pins; and a PCB coupled to the plurality of spring pins, figure 1 of the applied prior art, clearly shows the substrate coupled between the chip and the plurality of the spring pins and a PCB coupled to the plurality of spring pins.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Donner et al., discloses spring contact element with V shape having multiple cross sectional shape.

Kanji et al., discloses flexible pins having flexibility for high-density integrated circuit package.

Bargain et al., and Babuka et al., disclose the spring connector with various shapes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (6:30 - 4) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 305 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp
August 20, 2002



KAMAND CUNEO
PRIMARY EXAMINER